

Where do women travel to give birth within New Zealand?

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Presented at SIRC NZ 2013 - GIS and Remote Sensing Research Conference
University of Otago, Dunedin, New Zealand
August 29th - 30th 2013

Keywords and phrases: Maternity services, travel patterns, spatial weight, ethics

1.0 INTRODUCTION

The objective of this study is to analyse the travel patterns of New Zealand women regarding the location of the facility selected for birth. Previous studies have been conducted in New Zealand which investigated access to maternity facilities and maternity provider availability in rural areas (Beere & Brabyn 2006; Brabyn & Skelly 2002; Hendry 2009; Farry, Thompson, Robertson, Benwell & Williamson 2008). Hunter et al. (2011) has also examined why women choose their place of birth, however there has been no investigation into the place of birth related to maternal residence and preferences of the birthing mother at the census mesh block or physical address scale. Some international studies (Grzybowski et al. 2011; Pitchforth et al. 2009; Gjesfjeld & Jung 2011) have touched on these issues, but the New Zealand Maternity system is unique and our population is sparsely spread, so study is required acknowledging these factors.

In 2012, a pilot study matching birthplace against residential area unit was conducted using spatial data from Statistics New Zealand, the results and limitations of which will be presented here.

This pilot study has led to a Master of Midwifery thesis which will collate and analyse residential location and birth place co-ordinates from Southern District Health Board (SDHB) and private facility records in the context of mesh block-level census data and road networks. A survey of all birthing women will be conducted alongside the geospatial analysis to look for reasons behind travel patterns.

2.0 2012 PILOT STUDY

2.1 Data

Statistics New Zealand provided area unit-level instances of women birthing at each maternity facility in New Zealand for the 2011 calendar year. The data was generated from birth registration information. Homebirth data was excluded for the purposes of this pilot study, due to issues around potential identification of individuals and also the literature suggests that the choice to birth at home may involve different factors than for travelling to a maternity facility (Hunter et al. 2011; Abel & Kearns 1991).

2.2 Findings

The pilot study supports the findings of previous studies, such as Hunter et al (2011) who suggested that women from areas with high populations of Māori and Pasifika women were more likely to travel to the closest, often primary, birthing facilities. It also confirmed that the concentration of birthing women reflected areas with a younger demographic e.g. women of child bearing age.

The generalised nature of the data set limited the number of conclusions that could be drawn, however a number of patterns show promise for more detailed study.

In some areas women appeared to be by-passing primary and secondary birthing facilities to birth at a tertiary facility. The concentration appeared to be greater than expected for birthing mothers for whom a tertiary unit birth would be clinically indicated. A more detailed set of data and further analysis is required to confirm this.

2.3 Problems Encountered

2.3.1 Ethics - Identification of individuals

Area unit as the smallest geographical unit available without going through an ethics-approval process, as mesh block data in some areas may have the potential to identify individuals.

2.3.2 Area Unit vs Mesh Block

The aggregation of data to area unit prohibited accurate demographic and network analysis and hence identification of further geographic factors behind travel patterns.

2.3.3 Why?

While the existing data illustrates where women are travelling, it gives no indication as to why. Detailed location and census data, in combination with personal surveys will allow the application of spatial statistics techniques at a scale not yet performed in New Zealand.

3.0 ONGOING STUDY PLANS

3.1 Thesis Proposal

The proposed thesis is a mixed methodology project comprising of three parts. The first is a replication of the pilot study with 2012 data to highlight any temporal patterns. The second part is to obtain birthplace locations, geocoded to residential address from Southern DHB and private facility records for a 12 month period. These two data sets will be validated and compared. The microdata generated will allow for more accurate analysis of movement with techniques not performed in the pilot study. Emergency transfer data will also be assessed in relation to chosen place of birth.

The third section will be a six month survey of all women birthing in the Southern DHB region. The questionnaire will contain demographic questions and some simple questions pertaining to the reasons for choosing their place of birth.

3.1.1 Anonymising Data

A large part of this research will require residential address data to be anonymised to ensure that the confidentiality of individuals in all data is respected. One of the biggest challenges of the project will be addressing this issue while still maintaining the integrity of the spatial data, especially with respect to road network topologies. It is planned that a process can be developed to obfuscate the data set to allow the results to be presented. For example, it would be possible to retain the microdata with the use of automation via a script and shift the resulting data in some way that will still accurately portray any geographical relationships. Exploration and testing of various GIS techniques to achieve anonymisation needs to be completed before ethics approval can be obtained.

3.1.2 Mapping the survey

It is anticipated that some survey data of factors important to women and their families in regard to choice of birthplace can be quantified spatially. Each facility will be weighted by desirability and then compared to travel patterns predicted using unweighted factors such as drive time (Haynes & Fotheringham 1984).

4.0 CONCLUSION

The pilot study using geospatial data and GIS tools to track women's travel patterns related to the location and facility they chose to give birth raised a number of ideas for further study. However it also highlighted issues related to micro data and ethics involved when using spatial tools for health research.

ACKNOWLEDGEMENTS

Funding for the purchase of the 2011 Statistics New Zealand Area Unit data was kindly provided by a Nursing and Midwifery Scholarship Rotary Award. Funding for on-going research has been received through a Health Workforce New Zealand Scholarship.

DEFINITIONS

Primary Maternity services

The Primary Maternity Facility, in conjunction with the Lead Maternity Carer (LMC) or DHB Co-ordinated Primary Midwifery care, provides primary maternity inpatient services during labour and birth and the postnatal period until discharge home for uncomplicated births. Facilities do not provide obstetric specialists or anaesthetic options such as epidurals.

Secondary Maternity services

Secondary maternity services are provided where women or their babies experience complications that need additional maternity care involving Obstetricians and other Specialists.

Tertiary Maternity services

Tertiary maternity services includes additional maternity care provided to women and their babies with highly complex needs who require consultation with and/or transfer of care to a multidisciplinary specialist team.

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